

INFLUENCE OF HEAT UNITS AND MATURITY CLASS ON COTTON YIELDS AT DIFFERENT LOCATIONS

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ABSTRACT: There are several factors that affect cotton maturity including variety selection, pesticide program, nitrogen rates, and heat units. Maturity delays are not noticeable every year. In our studies heavy rain and low temperatures occurred the first six weeks after planting at Holly Springs, Nesbit, and Raymond. High temperatures for the month of May failed to exceed 90 degrees at all locations. Cloudy overcast days also decreased the DD 60's in May. Accumulative DD 60's were running 400 below average at the middle of June. Total DD 60's were below the average at the end of June for all locations. However, DD 60's were adequate at Raymond at the end of the growing season but remained low at Holly Springs and Nesbit throughout the growing season. Yields ranged from a high of 2900 to a low of 2249 lb seed cotton/ac at Holly Springs; 3294 to 2770 lb seed cotton/ac at Nesbit; and 3949 to 3471 lb seed cotton/ac at Raymond. PM1218BG/RR was the high yielding variety at Holly Springs and Nesbit and the low yielding variety at Raymond. DP 555BG/RR was the high yielding variety at Raymond and was significantly higher than the high yielding variety (PM 1218BG/RR) at Holly Springs and Nesbit.

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KEYWORDS: Tillage, Cotton, DD 60'S

MATERIALS AND METHODS: Four popular varieties (PM 1218BG/RR, SG 747, DP 5415R, and DP 555BG/RR) were evaluated for seed cotton yield at Holly Springs, Nesbit and Raymond in 2004. Test site was located on a Grenada silt loam soil at Holly Springs and Raymond, and Collin fine sandy loam at Nesbit. Cultural practices were no-till at Holly Springs, and conventional tillage at Nesbit and Raymond. Experimental Design was a randomized complete block with 4 replications. Plot size was two 38-inch rows, 50 ft long.

At Raymond and Nesbit the plot area was hipped in early March and rehipped in early April. Fertilizer (N, P, and K) was broadcast over the plot area according to soil test recommendations in April before the plots were rehipped. At Holly Springs the plot area was sprayed with Roundup (glyphosate) at 1.0 lb ai/ac in late March 2004. Fertilizer (N, P, and K) was broadcast over the plot area according to soil test recommendations in late April. Cottonseeds were planted using a plot planter adapted for planting plots. Plots were planted the last week of April for Holly Springs and Nesbit and the first week of May for Raymond at a rate of 4 live seed per ft/ row based on laboratory seed germination test for each variety. Terrachlor Super X 18.8G (pentachloronitrobenzene) 1.5 lb ai/ac + Temik 15G (aldicarb) 0.75lb ai/ac was applied as granules in furrow at planting. Cotoran (fluometuron) 1.0 lb. ai/ac + Staple (pyrithiobac) .06 oz

ai/ac. were broadcast over the tilled area. Cotoran + Gramoxone (fluometuron + paraquat) 1.0 lb ai/ac + 0.625 lb ai/ac and Staple (pyrithiobac) .06 oz ai/ac were broadcast over the no-tilled plots behind the planter. Roundup at 1.0 lb ai/ac was sprayed over the entire plot area two weeks after emergence. CyPro (cyanazine) at 0.75 ai/ac and MSMA (MSMA) at 1.5 lb ai/ac were direct sprayed over the plot area as a layby treatment. Cotton was defoliated on September 21 with Superboll (ethephon) 1.5 lb ai/ac + Def 6 (tribufos) 1.5 lb ai/ac. Collected data were analyzed using analysis of variance procedures. Mean separation was accomplished by least significant difference (LSD) at the 5% significance level.

RESULTS AND DISCUSSION: Heavy rain and low temperatures occurred the first three weeks after planting. High temperatures for the month of May failed to exceed 90 degrees. Rainy, overcast days also decreased the DD 60's in May. Accumulative DD 60's were running about 300 below average at the first of June. Total DD 60's fell to 400 below the average during the first 15 days of June. There was high plant-to-plant variation in squaring in all plots. High variation in squaring resulted in a high variation in time and position of boll set on the main stem. This high variation in boll set led to considerable differences in boll maturity in all plots. Yields ranged from a high of 2900 to a low of 2249 lb seed cotton/ac at Holly, Springs, and 3294 to 2770 lb seed cotton/ac at Nesbit, and 3949 to 3471 lb seed cotton/ac at Raymond (Table 1). PM1218BG/RR was the high yielding variety at Holly Springs and Nesbit and the low yielding variety at Raymond. DP 555BG/RR was the high yielding variety at Raymond and was significantly higher than the high yielding variety (PM 1218BG/RR) at Holly Springs and Nesbit.

Table 1. Seed cotton yields of 4 varieties tested at 3 locations having different heat units.

Variety	Holly Springs, Marshall Co. (DD 60'S)<2000	Nesbit, Desoto Co. (DD 60'S) ~2100	Raymond, Hinds Co. (DD 60'S) - 2452
PM 1218BG/RR	2900	3294	3471
SG 747	2852	3260	3485
DP 5415R	2541	2756	3994
DP 555BG/RR	2249	2770	3949
CV (%)	7.2	5.7	8.1
LSD .05	204	215	273